CLAIMS

1. A method for fabricating a structured high resolution scintillating device based on light guiding of secondary produced scintillating photons for use in an X-ray pixel detector device with an image detector chip (1), **characterized by** the steps of

fabrication of a silicon pore matrix (8) presenting a pore spacing (10) corresponding to the image detector pixel size (2), by utilizing silicon etching techniques such as deep reactive ion etching, electrochemical techniques or other techniques providing high-aspect ratios such that thin pore walls of thickness reaching down to a few micrometers will be maintained for an active detection area optimization;

using the silicon pore matrix (8) as a mold when melting a scintillator material into the pores to form in each pore a single scintillating block in order to eliminate grain-boundary scattering of scintillating photons.

2. The method according to claim 1, **characterized by** the further step of providing, after etching but before molding, a reflection layer for light guiding by oxidation of the silicon pore matrix (8) or by deposition of any layer having a resulting refractive index being lower than that of the used scintillator material.

3. The method according to claim 1, **characterized by** the further step of, after etching but before molding, depositing a metallic reflective layer in the pores.

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~~4. The method according to any of the preceding claims, characterized by the further step of producing a pore spacing being less than the image detector pixel size (2) to provide a structure without the need for alignment to the image detector chip (1).~~

5. A scintillating device for simultaneously maintaining resolution and increased sensitivity for X-ray radiation in an imaging arrangement, **characterized by** utilization of a fabrication method producing a silicon pore matrix (8) presenting a pore spacing (10) corresponding to an image detector pixel size (2), the pore matrix having deep pores (10) presenting thin walls of a thickness reaching down to a few micrometers to create a pore spacing corresponding to the pixel size (2) of an image detector chip (1), the pore matrix (8) further containing scintillating material which is melted into the pores (10) to form in each pore a single scintillating block in order to eliminate grain-boundary scattering of scintillating photons.

6. The device according to claim 5, **characterized by** a reflective layer (12) onto the thin walls of the matrix to increase light guiding down to the image detector chip (1).

7. The device according to claim 5, **characterized in** a pore spacing being less than the image detector pixel size (2) to thereby provide a structure without need for alignment to the image detector chip (1).

8. The device according to claim 6, **characterized in** a pore spacing being less than the image detector pixel size (2) to thereby provide a structure without need for alignment to the image detector chip (1).

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